

In the claims:

Please cancel claim 6, 7, 8, 23, 24, 28, and 29.

Please amend claim 1, 9, 10, 11, 14, 15, and 25 as follows:

- Sub B1  
A2
1. A flexible instrument, comprising:
- a flexible member having an intermediate portion and a distal tip;
  - at least one fiber-optic intermediate sensor disposed at a predetermined point along said intermediate portion of said member for providing an intermediate path signal indicative of the path of said intermediate portion of said flexible member; and
  - at least one distal sensor positioned proximate said distal tip of said flexible member for providing a distal tip position signal which is independent of the intermediate path signal and indicative of the position of said distal tip of said flexible member.

A3

5. The flexible instrument of claim 1 wherein said at least one fiber-optic intermediate sensor includes a fiber-optic flex sensor.

6. The flexible instrument of claim 1 wherein said at least one fiber-optic intermediate sensor includes a fiber-optic twist sensor.

7. The flexible instrument of claim 1 wherein said at least one fiber-optic intermediate sensor includes at least one optical fiber loop sensor having a light attenuation characteristic which varies in accordance with the path of said intermediate portion of said flexible instrument.

- A4 Sub B3
14. A flexible instrument, comprising:
- a flexible member having an intermediate portion and a distal tip;

at least one fiber-optic intermediate sensor disposed at a predetermined point along said intermediate portion of said member for providing an intermediate path signal indicative of the path of said intermediate portion of said flexible member;

at least one distal sensor positioned proximate said distal tip of said flexible member for providing a distal tip position signal which is independent of the intermediate path signal and indicative of the position of said distal tip of said flexible member; and

a processor responsive to said intermediate path signal and said distal tip position signal for providing an indication, in a common reference frame, of the position and angular orientation of said distal tip and said intermediate portion of said flexible instrument.

11  
18.

A flexible instrument system, comprising:

a flexible member having <sup>a proximal portion,</sup> an intermediate portion and a distal tip;

at least one fiber-optic intermediate sensor disposed at a predetermined point along said intermediate portion of said member, said intermediate sensor providing an intermediate path signal indicative of the path of said intermediate portion of said flexible member; and

a pair of elements, one of said pair of elements being an energy transmitter and the other being an energy sensor, where one of said pair of elements is positioned proximate said distal tip of said flexible member and the other said element is positioned remotely, where the combination of said pair of elements provides a distal tip position signal which is independent of the intermediate path signal and indicative of the position of said distal tip of said flexible member.

19  
25.

A method for determining the three-dimensional position of a flexible instrument having <sup>a proximal portion,</sup> an intermediate portion and a distal tip, comprising:

controlling a magnetic field proximate the flexible instrument;

A5  
generating, with at least one fiber-optic sensor, an intermediate path signal indicative of the path of the intermediate portion of the flexible instrument; and generating a distal tip position signal which is independent of the intermediate path signal and indicative of the position of the distal tip of the flexible instrument.

A6  
In the abstract:

Please replace the abstract with the following version.

A flexible instrument includes a flexible member having an intermediate portion and a distal tip. At least one fiber-optic intermediate sensor disposed at a predetermined point along the intermediate portion of the member provides an intermediate path signal indicative of the path of the intermediate portion of the flexible member. At least one distal sensor positioned proximate the distal tip of the flexible member provides a distal tip position signal which is independent of the intermediate path signal and indicative of the position of the distal tip of the flexible member.

In the drawings:

Please substitute the three sheets of informal drawings originally filed in the subject application with the three sheets of formal drawings submitted herewith.